

Bhoj Reddy Engineering College for Women: Hyderabad

Department of Electronics and Communication Engineering

Lesson plan of faculty member for the academic year 2017

Class: II B Tech

Branch-Section: ECE-A

Semester: I

Subject: Signals and Stochastic process

Lectures per week: 4+1 (Tutorial)

Lecture Number	Topics to be covered	Date (s)
UNIT - I Signal Analysis		
1	Analogy between vectors and signals, Orthogonal Signal Space	12 July 2017
2	Signal approximation using Orthogonal functions,	13 July 2017
3	Mean Square Error	
4	Tutorial: Problems on Orthogonal functions, Mean square Error	14 July 2017
5	Closed or complete set of orthogonal functions	15 July 2017
6	Orthogonality in complex functions, problems	18 July 2017
7	Exponential and Sinusoidal signals	19 July 2017
8	Concepts of Impulse function, Unit Step function, Signum function	20 July 2017
9	Tutorial: Problems on Impulse, Step, Signum functions	21 July 2017
10	Signal Transmission through Linear Systems: Linear System, Impulse response, Response of a Linear System, Linear Time Invariant (LTI) System, Linear Time Variant (LTV) System	22 July 2017
11	Transfer function of a LTI system, Filter characteristics of Linear Systems, Distortion less transmission through a system. Relationship between Bandwidth and Rise time	25 July 2017
12	Concept of convolution in Time domain and Frequency domain	26 July 2017
13	Graphical representation of Convolution	27 July 2017
14	Tutorial: Problems on Convolution	28 July 2017
15	Convolution property of Fourier Transforms	29 July 2017
16	Analogy between vectors and signals, Orthogonal Signal Space	1 August 2017
17	Signal approximation using Orthogonal functions	2 August 2017
18	Revision	3 August 2017
19	Tutorial: Problems	4 August 2017
UNIT – II Fourier series, Transforms, and Sampling:		
20	Representation of Fourier series, Continuous time periodic signals	5 August 2017
21	Properties of Fourier Series, Dirichlet's conditions	8 August 2017
22	Trigonometric Fourier Series and Exponential Fourier Series, Complex Fourier spectrum.	9 August 2017
23	Fourier Transforms: Deriving Fourier Transform from Fourier series, Fourier Transform of arbitrary signal	10 August 2017
24	Tutorial: Problems on Trigonometric Fourier Series and Exponential Fourier Series	11 August 2017
25	Fourier Transform of standard signals	12 August 2017
26	Fourier Transform of Periodic Signals, Properties of Fourier Transform	16 August 2017
27	Fourier Transforms involving Impulse function and Signum function	17 August 2017
28	Tutorial: Problems on Fourier Transforms	18 August 2017
29	Sampling: Sampling theorem – Graphical and analytical proof for Band Limited Signals	19 August 2017
30	Reconstruction of signal from its samples	22 August 2017
31	Effect of under sampling – Aliasing.	23 August 2017
32	Revision	24 August 2017
UNIT – III Laplace Transforms and Z-Transforms:		
33	Laplace Transforms: Review of Laplace Transforms (L.T), Partial fraction expansion,	26 August 2017

34	Inverse Laplace Transform, Periodicity of Discrete time signal using complex exponential signal	28 August 2017
35	Concept of Region of Convergence (ROC) for Laplace Transforms, Constraints on ROC for various classes of signals	29 August 2017
36	Properties of L.T, Relation between L.T and F.T of a signal,	30 August 2017
37	Laplace Transform of certain signals using waveform synthesis	31 August 2017
38	Z-Transforms: Fundamental difference between Continuous and Discrete time signals	1 September 2017
39	Discrete time signal representation using Complex exponential and Sinusoidal components	5 September 2017
40	Concept of Z- Transform of a Discrete Sequence	9 September 2017
41	Distinction between Laplace, Fourier and Z Transforms	12 September 2017
42	Region of Convergence in Z-Transform, Constraints on ROC for various classes of signals,	13 September 2017
43	Inverse Z-transform, Properties of Z-transforms.	14 September 2017
44	Tutorial: Problems on Laplace and Z- Transforms, Revision	15 September 2017
UNIT – IV Random Processes: – Temporal Characteristics		
45	The Random Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes	16 September 2017
46	Distribution and Density Functions	19 September 2017
47	Concept of Stationarity and Statistical Independence	21 September 2017
48	Tutorial: Problems on Stationary Processes	22 September 2017
49	First-Order Stationary Processes	23 September 2017
50	Second- Order and Wide-Sense Stationarity	3 October 2017
51	(N-Order) and StrictSense Stationarity	4 October 2017
52	(N-Order) and StrictSense Stationarity	5 October 2017
53	Tutorial: Problems on Stationary Processes	6 October 2017
54	Time Averages and Ergodicity	7 October 2017
55	Autocorrelation Function and Its Properties	11 October 2017
56	Cross-Correlation Function and Its Properties	12 October 2017
57	Tutorial: Problems on Autocorrelation and Cross-Correlation Functions	13 October 2017
58	Covariance Functions, Gaussian Random Processes, Poisson Random Process	14 October 2017
59	Random Signal, Mean and Mean-squared Value of System Response	17 October 2017
60	Autocorrelation Function of Response Cross-Correlation Functions of Input and Output	19 October 2017
61	Tutorial: Problems on Autocorrelation and Cross-Correlation Functions	20 October 2017
62	Revision	21 October 2017
UNIT- V: Random Processes– Spectral Characteristics		
63	The Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function	24 October 2017
64	The Cross-Power Density Spectrum, Properties	25 October 2017
65	Relationship between Cross-Power Spectrum and Cross Correlation Function	26 October 2017
66	Spectral Characteristics of System Response: Power Density Spectrum of Response	27 October 2017
67	Tutorial: Problems on Power Spectrum	28 October 2017
68	Cross-Power Density Spectrums of Input and Output, Relationship between Power Spectrum and Autocorrelation Function	30 October 2017

69	Relationship between Power Spectrum and Autocorrelation Function	31 October 2017
70	Relationship between Power Spectrum and Autocorrelation Function	2 November 2017
71	Tutorial: Problems on Auto correlation, Power Spectrum	27 October 2017
72	Cross-Power Density Spectrums of Input and Output.	28 October 2017
73	Problems on Auto correlation, Power Spectrum, Cross correlation	30 October 2017
74	Revision of Previous question papers	31 October 2017
75	Revision of Previous question papers	1 November 2017
76	Revision of Previous question papers	2 November 2017
77	Revision of Previous question papers	3 November 2017
78	Revision of Previous question papers	4 November 2017
79	Revision of Previous question papers	7 November 2017

Text books:

- TEXT BOOKS: 1. Signals, Systems & Communications - B.P. Lathi , 2013, BSP.
2. Signal and systems principles and applications, shaila dinakar Apten, Cambridge university press, 2016.
3. Probability, Random Variables & Random Signal Principles - Peyton Z. Peebles, MC GRAW HILL EDUCATION, 4th Edition, 2001
4. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed.,

Name and signature of the faculty: Eleena B ----

Name and signature of Head of the Department: Ms N Shribala ----